Environmental Impact Assessment Review 31 (2011) 25–35

Contents lists available at ScienceDirect

Environmental Impact Assessment Review

journal homepage: www.elsevier.com/locate/eiar

Making communities safer from crime: An undervalued element in impact assessment

John Glasson [a,b,*], Paul Cozens [b]

[a] Oxford Brookes University, Oxford, UK
[b] Curtin University, Perth, Australia

ARTICLE INFO

Article history:
Received 21 December 2009
Received in revised form 16 March 2010
Accepted 22 March 2010
Available online 8 May 2010

Keywords:
Safety
Crime
Fear of crime
Impact assessment
Environmental criminology
Designing out crime
Improving practice

ABSTRACT

Crime and safety are significant issues for individuals, communities and businesses but they have tended to be undervalued elements in the consideration of social impacts in impact assessment theory and practice. It has been argued that crime is a form of pollution and an externality of development. In principle, the precautionary impact assessment family of approaches should be very useful here. The paper explores first the coverage of crime and safety issues in both the longer history of EIA, followed by the much shorter history of SEA and Sustainability Appraisal (SA). It then considers several key issues for advancing better practice. These include: the recognition of the lifecycles of projects and plans and the relevant dimensions of the local safety and crime baseline; the need to employ meaningful data, including "fear of crime" considerations; and the consideration of innovative approaches to the use of indicators. Evidence and theories from the field of environmental criminology are presented as crucial to understanding crime and its association with land-use. The paper concludes with an exploration of appropriate mitigation measures for anticipating and designing out crime. Examples draw in particular on evolving practice in the UK and Australia.

1. Introduction

Despite the global acceptance of the "sustainability" concept, its scope and nature is still a somewhat contested and confused territory (Faber et al. 2005). There are numerous definitions, but many refer to the triple bottom line (TBL), and now to the quadruple bottom line (QBL, or TBL+1), and the importance of synergies between the environmental, economic, social and governance factors involved in decision-making (see also Vanclay, 2004 for an interesting critique of these concepts). In the UK, these dimensions are covered in the *Sustainable Development Strategy* (DEFRA, 2005) with the "guiding principles" of "living within environmental limits; ensuring a strong, healthy and just society; achieving a sustainable economy; and promoting good governance", all conditioned by the need to "use sound science responsibly". More generally, sustainability can be seen as the sustaining ability of a system to function in the long term—an end state in which all human activities can be maintained within the existing capacity of the planet.

There is even less consensus on the definition of social sustainability, with various definitions depending on discipline specific criteria or particular study perspective. In the Lisbon Declaration (European Council, 2000) the main dimensions of social sustainability were seen as: education, employment policy (to create more and better jobs), the promotion of equality (to counter poverty and social exclusion), and *social protection*. Work by Bramley et al (2006) on urban form sees social sustainability as depending on social networks, community participation, sense of place and community stability, and *security*. These definitions both make reference to safety issues–as social protection, and security–and, without doubt, safety and freedom from crime are high on the agenda of most communities. Yet, a first contention here is that such issues are still not adequately integrated within the concept of sustainability, and this is explored further in Section 2.

A range of tools has been developed to assess and measure social sustainability, including indicators in various forms, and impact assessment. The focus here is on the growing, and increasingly fragmented family of impact assessment tools. In the UK, these have developed *in scale* from the original project based Environmental Impact Assessment (EIA), which in Europe emanated from the EU EIA Directive (CEC, 1985) to the more plan/programme level Strategic Environmental Assessment (SEA), required under the EU SEA Directive (CEC, 2001), plus its UK variant of Sustainability Appraisal (SA). In addition, there has also been a shift in *scope* from the narrow biophysical approach of early EIA activity and of some current SEA activity, towards a more holistic approach including biophysical, social and economic dimensions. In principle, this precautionary impact assessment family of approaches should be very useful in considering issues of crime and safety, at both the level of the

* Corresponding author. Oxford Brookes University, Oxford, UK. Tel.: +44 1865 483401.
E-mail address: jglasson@brookes.ac.uk (J. Glasson).

0195-9255/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.eiar.2010.03.007

individual project and at the higher more strategic level of plans and programmes. This second contention is explored in Sections 3, 4 and 5, with a consideration of the evolving role of the social dimension to impact assessment, followed by examination of recent practice at both the project specific and more strategic levels.

Further sections of the paper then: examine key structural and data issues confronting the effective consideration of crime and safety in impact assessment and some suggestions for ways forward (in Section 6), and the role of environmental criminology and "designing out crime" as an important mitigation tool (in Section 7). The paper concludes with some recommendations for better practice. Throughout, the paper draws on case study material from the UK and Australia (especially Western Australia) to exemplify some of the issues and responses in practice.

2. Crime, safety and sustainability

Safety and freedom from crime are very important in everyday life. In terms of human needs, Maslow's (1943) hierarchy of needs suggests sustainable environments should cater for biological and physiological (e.g.: air, food, drink, and shelter), safety (e.g.: protection, security, and law), affiliation (e.g.: belonging and acceptance), esteem (e.g. achievement and status), and self-actualisation (expression and fulfillment) needs — in that order. Crime and freedom from crime are certainly high on peoples' agendas of most important issues in many countries worldwide. For example the UK population ranks crime as being the most important issue affecting the perception of a "good place to live" (Table 1). In 2004, an Australian survey of 7000 respondents, 26% reported that they felt unsafe while walking after dark in their own neighbourhoods (Johnson, 2005).

Crime is also a major cost to society. In Australia, the financial costs to the community have been estimated at approximately AUD$32 bn per annum — excluding the very important psychological and emotional costs (Mayhew, 2003). The included costs divide into AUD$13 bn for tackling crime and AUD$19 bn for costs to the community (e.g. AUD$4 bn property loss, and AUD$6 bn fraud). For the UK, some comparative figures suggest the costs of crime are conservatively estimated at £60 bn pounds (Brand and Price, 2000) but again, this figure does not include important costs such as fear of crime or quality of life impacts (Table 2).

Furthermore, Roman and Farrell (2002) argue that crime can be considered as a form of pollution and an externality of development. They contend that poor design (of places and products) can result in social costs (crime), which are borne not by the producers but by others in the community. In terms of global warming, Professor Ken Pease, an eminent criminologist at the Jill Dando Institute for Crime Science, has recently analysed Home Office figures and formulae from the International Energy Agency indicating that crime itself has an ecological footprint (Table 3). Different types of crimes are associated with different levels of CO_2 emissions (e.g. 2.5 tonnes for a burglary and 4.9 tonnes for a sex attack) (Clements, 2009). The total estimated carbon cost of crime is 6 million tonnes per annum. It derives largely from police driving their vehicles, victims visiting hospitals, repairs to damaged property and the wasteful cost of replacing stolen goods.

Crucially, over 30 years ago Herbert (1977, p 208) observed "as a geographical paradigm, environmentalism might have provided the most logical link to a geography of crime. That it did not do so was in part a function of scale, but more particularly of its view of the natural environment as the habitat of man." Although, the planning professional has a key role in promoting sustainable development, "most planning proceeds with little knowledge of crime patterns, crime attractors, crime generators, the importance of edges, paths and nodes or the site specific solutions that facilitate or even encourage crime" (Brantingham and Brantingham, 1998, p53).

But how are safety and crime issues covered within sustainability frameworks? As already noted, we are now adopting a more holistic approach to sustainability, reflected in both concepts and practice. Sustainability frameworks increasingly include notions of social sustainability: equity, opportunity, quality of life and participation (CAG, 1997), but few have developed sophisticated operational strategies to measure or combat crime and the fear of crime. For Carmona et al. (2003), the human needs principle within sustainability should allow "…safe and crime free human contact".

Sustainability has often, and predominantly, been seen as an environmental or economic issue (Du Plessis, 1999; Cozens, 2002) which fails to consider the issues of crime and fear of crime to any meaningful extent, while others have discussed the subject minimally (Goodchild, 1994). Crime as a dimension of sustainability has only more recently been subject to widespread evaluation and discussion (Du Plessis, 1999; Cozens, 2002, 2008a) and arguably this represents an important addition to the evolving body of knowledge on social sustainability. A study by Knights et al (2002) has highlighted crime as a major factor influencing sustainability. The organic nature and our current understanding of sustainability means that the key sustainability indicators are not fixed and need to continually respond to changing circumstances, especially as our knowledge develops (DETR, 1999a,b). A prerequisite for a sustainable environment is that it should not pose a threat to current and future users. Indeed, Dewberry (2003) argues that there are various synergies between sustainable

Table 1
The most important issues that constitute a good place to live.

Issue	% of respondents
Low crime	66
Health services	47
Clean streets	37
Affordable housing	36
Shopping facilities	29
Education provision	28
Public transport	26
Low levels of traffic congestion	26
Parks and open spaces	25
Job prospects	21

Source: Office of the Deputy Prime Minister (ODPM) (2005), p11.

Table 2
Estimated costs of crime in the UK.

Crimes against the individual/household	32.2
Commercial and public sector victimisation	9.1
Fraud and forgery	13.8
Traffic and motoring/other offences	4.8
Total costs in £ (billions)	59.9

Source: Brand and Price (2000).

Table 3
Estimates for the carbon footprint of crime (tonnes).

Type of crime	CO_2 per offence	Total CO_2
Homicide	170.63	131,726
Serious wounding	18.21	328,690
Other wounding	2.14	954,956
Sexual assaults	4.92	273,212
Common assault	0.45	90,326
Robbery	3.71	345,182
Burglary of homes	2.50	716,250
Other burglary	2.50	790,934
Theft not vehicle	0.56	644,534
Theft of vehicle	2.75	499,903
Theft from vehicle	0.47	219,732
Attempted vehicle theft	0.26	15,986
Criminal damage	0.39	433,151

Source: (Clements, 2009).

Table 4
Synergies between crime prevention and sustainability.

Crime prevention	Sustainability
Shared responsibility for crime	Shared responsibility for sustainability
Offenders to acknowledge responsibility	Polluters to acknowledge responsibility
Crime events promote social exclusion	Inequity in the security of communities
Reducing effects of crime through investment in evidence and effectiveness	Reducing environmental impacts through investment in evidence and effectiveness
Reducing the impacts of crime through developing products and systems which are more resistant to criminal activity	Promoting sustainability by developing products and systems which are more environmentally and socially responsible
The need for government strategies partnerships, evidence-based action and accountability	The need for government strategies, partnerships, best practice and environmental and social responsibility
Promoting quality of life issues	Understanding quality of life issues
Enhancing understanding of the ecology of crime and environmental criminology	Enhancing understanding of the ecology of the environment
Use of the built environment to reduce opportunities for crime and promote liveability	Use of the built environment to reduce waste and promote liveability and sustainability

Source: Cozens (2007a) adapted from Dewberry (2003).

development and crime prevention including: shared responsibilities, foci, objectives and approaches (see Table 4). She comments "… the levels of crime activity directly affects the degree to which we can move towards a more equitable and just society (a component of sustainability)."

In a recent special edition of the journal Built Environment[1], various authors discuss security as a route to sustainability, rather than as an obstacle to be overcome. Armitage and Gamman (2009, p298) observe "There is a common misunderstanding that sustainability means 'environmental' or 'green' and that this interpretation misses the main point of sustainable development, which is to achieve social, economic and environmental outcomes at the same time."

3. The potential role of impact assessment

Impact assessment is a process that examines the consequences of development actions in advance; it is an excellent example of the precautionary principle (Glasson et al., 2005). In the UK a major driver has been EU legislation, and there is now much good and evolving practice in EU Member States. Impact assessment has also developed well in countries worldwide. Australia, and especially Western Australia, provides some particularly good approaches (Wood, 2003). In the UK, the evolution in scale and scope of impact assessment has seen the spread of practice to include, for example: Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Health Impact Assessment (HIA), Equality Impact Assessment (EqIA), Regulatory Impact Assessment (RIA), and Sustainability Appraisal (SA).The latter has developed largely at the plan level, and the UK Government requires an SA (incorporating a Strategic Environmental Assessment (SEA)) for land-use plans. HIA has been a particular growth area in recent years; EqIA is more recent, and focuses on the positive and negative impacts of developments on equality target groups in particular areas.

There has been considerable debate around the scope of impact assessment, the nature of the social dimension, and the role and nature of SIA. Some authors refer to social impact assessment; others refer to socio-economic impact assessment. Some see SIA as an integral part of EIA, providing the essential "human elements" complement to the narrow biophysical focus of many Environmental Impact Statements (EISs); others see SIA as a separate field of study and a separate process, fearing that it runs the risk of marginalisation as an integral part of EIA (Glasson, 2009). But whatever the name and allegiance, SIA can be seen as a focus on the "people impacts" of development actions–impacts on day to day quality of life–jobs, health, safety, shelter, education, recreation, community and more.

The early recognition, by some analysts, of the importance of socio-economic impacts in the EIA process and in the resultant EISs, has been partly reflected in legislation. The definition of the environment, as included in the 1979 US CEQ regulations addresses biophysical components and socio-economic factors and characteristics. The EU Directive 85/337/EEC (CEC, 1985) requires a description of possible impacts on human beings. Furthermore, early guidance from the UK Government suggested that "certain aspects of a project including numbers employed and where they will come from should be considered within an environmental statement" (DoE 1989). Yet despite some legislative impetus, the consideration of social and economic impacts has continued to be the "poor relation" in UK EIA and in EISs (Glasson and Heaney, 1993; Chadwick, 2002) and the uncertain status in the EIA process remains. Yet, socio-economic impacts are significant because the economic fortunes and lifestyles and values of people are important, and they merit a higher profile.

Back in 1991, a UN study of EIA practice in various countries advocated a number of changes in the EIA process and documentation including giving greater emphasis to socio-economic impacts (UNECE, 1991). In a different context, in a survey of academics on the effectiveness of the US National Environmental Policy Act, Canter and Clark (1997) drew out five priorities for the future, one of which was the need for better integration of biophysical and socio-economic factors and characteristics. For the UK, Chadwick (2002) argues for explicit recognition by all EIA stakeholders for inclusion of socio-economic impacts as an important impact category. Vanclay (2002) stresses the importance of the SIA process and of community involvement during project planning. SIA has been a significant theme over time in the work of the International Association for Impact Assessment (IAIA), and there are signs of increasing recognition in practice, with more SIA inputs in EIAs, plus widening scope of SIA content and methodological advances. In addition, in recent years the growth in impact assessment at the strategic level, particularly through the more holistic SA approach, has given a further boost to the consideration of socio-economic impacts. The paper now turns to the coverage of crime and safety in this evolving and more holistic approach to impact assessment, first at the project EIA level, and then at the more strategic SEA/SA plan and programme level.

4. Crime and safety issues in environmental impact assessment

Crime and safety issues appropriately fit within the social/socio-economic dimension in EIA/SIA. As noted above, this dimension has been thinly covered to date, although there are some promising signs. However even where there is better consideration of such issues, the focus has traditionally been on the economic dimension, and especially employment (Chadwick, 2002). A more recent study of social sustainability issues in EISs for UK urban regeneration and redevelopment projects (Glasson and Wood, 2009) shows that the scope of the social/socio-economic content in this set of project ESs has widened from 1990's experience to cover: population profile including occupational groups; learning and employment; community facilities and services; recreation and public open space; social inclusion and community integration; economic and business context; and general well-being. Crime and safety issues are generally included in the category of "general well-being", which also tends to include deprivation and health issues.

[1] Built Environment (2009) Volume 35(3).

Major projects have life cycles, evolving from the idea/planning stage, through impact assessment, to construction, operation and eventual closure. Impacts, including socio-economic impacts, may vary greatly across these stages. The urban regeneration/redevelopment study (Glasson and Wood, 2009) found that variation in impacts by project stage was covered in about 50% of the EISs, although in several there was more focus on the operational than the construction stage, yet the latter stage can be both disruptive for a community and also very significant for employment and other issues. A few studies also recognised the importance of different geographical scales of impacts, especially between the construction and operational stages.

Crime and safety issues can vary considerably across project stages and project types. For major infrastructure projects (e.g.: power stations, ports, water and waste management projects) the construction stage can be particularly significant when workforces of often several thousands move into (often remote and rural) communities to build the project over periods of several years. For more service type projects (e.g.: major retail and leisure facilities) crime issues may be more a feature of the operational life of the development. The construction of the UK's most recent nuclear power station, Sizewell B, provides an interesting example of the potential crime issues associated with the construction stage of a major energy project in a relatively rural area.

The construction between 1988 and 1995 of Sizewell B, a 1200 MW Pressurised Water Reactor (PWR) nuclear power station, in a rural area of East Anglia in the UK had the potential to produce a wide range of significant local socio-economic impacts (CEGB, 1987). It was one of the largest civil engineering projects in Europe at the time. The total cost was over £2 bn, peak employment was over 5000 and the presence of a large in-migrant workforce was a particularly sensitive issue (Glasson and Chadwick, 1995). Although the impact predictions were not formally packaged in an EIS (prior to formal introduction of EIA in the UK), potential impacts were covered in a series of comprehensive reports (DoEN, 1986). There was considerable focus on the mix of local and non-local labour and the impact of the large latter group (c. 2500 at peak) on housing and local services such as health and education. But there was no consideration of the potential impacts of increased crime in the local community.

However, a project with a large, and predominantly young male in-migrant, workforce is likely to represent an issue for crime and other behavioural problems in the host locality, and this was initially the case for the Sizewell B project. The issue came to light, and unique evidence was gathered, through the vehicle of a major longitudinal monitoring study undertaken by the Impacts Assessment Unit (IAU) from Oxford Polytechnic (now Oxford Brookes University) (Glasson and Chadwick, 1995; Glasson, 2005). Information was provided by the Suffolk Constabulary on arrest levels in the local police division. This allowed the identification of Sizewell B construction employees in the local arrests, with a distinction between locally recruited and in-migrant employees. It should be noted, however, that recorded crime does not accurately reflect the true number of offences committed, because many offences go unreported, and many arrests do not result in convictions. However, in the early years of the construction programme the number of annual arrests in the local police division more than tripled, yet the population of the division had only increased by 25%. The national increase in the number of recorded criminal offences over the same period was 20%. Fig. 1 provides details on the trends in arrests, for drunk driving, and public order and drunkenness for the first 5 years of project construction. Whilst Sizewell B employees featured strongly in the statistics, what was particularly surprising was the increase in arrests for non-Sizewell B employees. This may be influenced by the presence of the construction workforce in the vicinity and perhaps also by the targeting of specific offences by the local police.

The identification of these behavioural problems through the monitoring process raised considerable local concern, and was instrumental in generating several timely mitigation responses. These included for example: site induction procedures for all new employees, which stressed the need for employees to be sensitive to the local community; a free shuttle minibus service operated in the evenings between the site hostel and the local (Leiston) town centre; provision of attractive facilities at the large 900-bed worker hostel on site, including a bar, to reduce the need for workers to travel into town in the evening; and regular monitoring by the developer staff (Nuclear Electric) in Leiston during the evening, especially around the town's

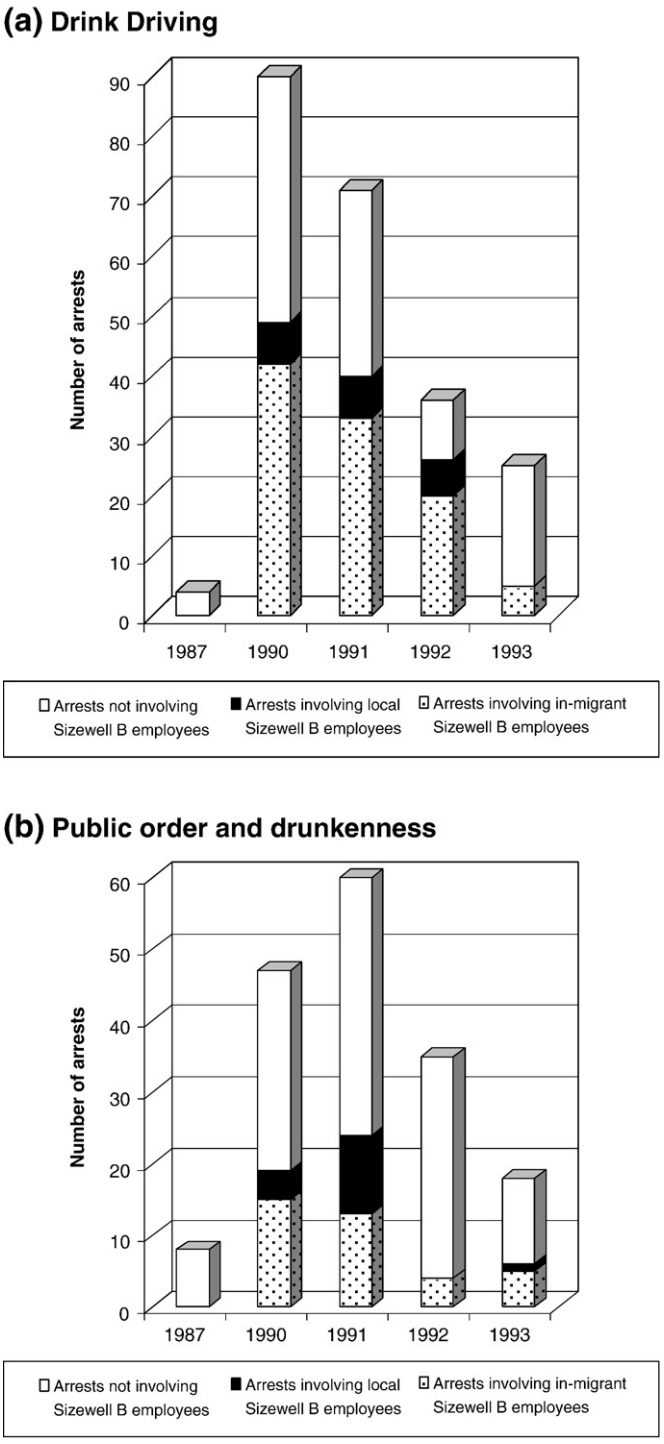

Fig. 1. Trends in arrest, for categories of offence, in the Leiston Police Division, Suffolk (UK) 1987–1993. Source: Glasson and Chadwick (1995).

pubs. The net effect as shown in Fig. 1 was a major reduction in the worker-behavioural problems, with a substantial fall in arrests over a period when the site workforce doubled in numbers and was growing rapidly towards peak employment of about 5000 (in 1992–1993). The overall conclusion by the local constabulary was that after some problems at the beginning, the construction workforce had then been relatively trouble free, with few serious incidents.

5. Crime and safety issues in the more strategic sustainability appraisal

There is sometimes not too big a gap between very large projects, and plans and programmes. The now emerging Sustainability Appraisal (SA) approach which, in the UK, has been mandatory since 2004 for the appraisal of the potential impacts of Regional Spatial Strategies (RSSs) and Local Development Plans (LDPs), is also being applied to major projects in some areas, including in Australia.

In the UK, the key stages in the SA process have been clearly documented in government guidance (ODPM, 2005). This guidance stresses that, to be effective, the SA should, inter alia, be objectives-led, with clear indicators and targets to identify directions of desired change against which plans can be appraised. Sets of objectives and indicators have been developed which cover environmental, economic, social, and also more recently governance, dimensions. Early national sources of such objectives and indicators include: "Quality of Life Counts" (DETR, 1999a,b); "Audit Commission Voluntary Quality of Life Indicators"; and "UK Sustainable Development Strategy" (DEFRA, 2005). There are also various regional documents (e.g.: "A Better Quality of Life in the South East" (SEERA, 2001); "South East England Integrated Regional Framework" (SEERA, 2004). In the social dimension, safety and security objectives (such as the reduction of anti-social behaviour; the reduction in crime and fear of crime), and crime indicators (such as overall level of crime, the level of domestic burglaries, violent offences and vehicle crimes; recorded crime per 1000 population) are now increasingly included as significant elements in the appraisal process. Table 5 is an extract from the SE England Integrated Regional Framework, which highlights crime and fear of crime as one of the set of six key social objectives, indicators and targets for appraising regional plans for this major UK region.

Another key aspect of the SA process is that it should be carried out concurrently with the plan-making process and should not be a stapled add-on at the end of that process. In this way the SA objectives can be clearly built into the planning process, and appropriate measures can be built into the plan to mitigate any anticipated adverse impacts; for example measures can be built in to design out crime (see Section 7).

At the other side of the world in Western Australia, the EIA system has been acknowledged as world-leading (Wood, 2003), although it has been weaker on the inclusion of the social dimension. In addition, Western Australia has not formally developed, certainly as much as in the EU, its strategic approach to appraisal, as reflected in SEA and SA in the UK and other countries in the EU. Yet there have been some interesting innovations worthy of note and of relevance to the consideration of crime and safety. In 2003, the state pioneered its State Sustainability Strategy (SSS) (Department of Premier and Cabinet, 2003) which advocated a more holistic view of sustainability. Crime and safety are considered as part of the SSS although references are implicit rather than explicit and limited to the twin principles of designing for safety and surveillance (Cozens, 2008a). There is also little information concerning crime or fear of crime as indicators of sustainability and how these two issues might be defined, measured, analysed and operationalised (Cozens, 2008a). Indeed a recognised limitation on the progress of the sustainability agenda in Western Australia has been the lack of a clear and operational set of sustainability indicators. The SSS noted that:

> "With a few exceptions, many integrative sustainability indicators have yet to be tested with any scientific rigour and, as such, lack the robustness to be applicable at the State or regional level. Until such time that integrative sustainability indicators are more fully developed, a TBL reporting approach will provide a useful indication of WA's progress to sustainability. Accordingly, the WA Government is looking to develop headline sustainability indicators to demonstrate WA's progress across the TBL and to assist with informing the community". (Department of Premier and Cabinet, 2003 p.80)

Progress has been slow but see Glasson (2008) for proposals for the development of a Statewide Sustainability Checklist for the Western Australian Planning System, which does include the objective "to reduce crime and improve safety", in addition to developing appropriate indicators and targets, as one of a proposed set of 23 headline objectives and indicators.

The wider sustainability approach is also being adopted by some of the more innovative developers/consultants for some of the recently proposed mega-projects in Western Australia, such as the Gorgon and Browse LNG (Liquefied Natural Gas) proposals. Although still not a formal requirement by the WA assessment system, such projects are building in more holistic TBL indicator approaches, sometimes using a Multi-Criteria Assessment format. In these approaches there is some limited consideration of crime and safety issues, sometimes wrapped up in more broad "quality of life" objectives, sometimes focusing primarily on the impact of large construction workforces in remote areas of this vast state and often with sensitive issues for the indigenous communities. It should be added that the WA EIA system is also undergoing a review which, inter alia, should give a higher profile to strategic assessment (EPA, 2009).

6. Some key issues for better practice

While the preceding sections of the paper do show some growing recognition of the importance of crime and safety issues in the impact assessment process, at both the project and plan levels, much is still quite basic and there is considerable scope to improve the coverage of these very important elements in everyday life. The following sections introduce a number of areas for improvement.

6.1. Recognition of the significance of the various dimensions of development and local area baselines

Impact assessment considers the impacts of a development action (e.g.: a project, plan) on a locality. Both the development action and the locality have characteristics which may be very significant in considering crime and safety issues. As noted above, projects have lifecycles which, for example, may cover over a hundred years for a nuclear power station, but may be of a much shorter duration for some extractive industries and for leisure and retail projects. Crime issues may be particularly problematic at certain stages in the life cycle—as in the construction stage for Sizewell B. But there may also be dynamic and long running issues in, for example, the operational life of residential, retail, leisure and transport activities if they are not anticipated and mitigated as far as possible through the planning and design process.

Local areas also have land-use characteristics of clear relevance to the assessment of potential crime and safety issues. Indeed, in the field of environmental criminology, different types of land-uses are associated with crime in different ways. Crimes against the person predominantly take place at home or in and around drinking establishments (Fattah, 1991) while property crimes are concentrated

Table 5
Social objectives, indicators and targets — SE England integrated regional framework.

Objective	Indicator	Target
Social progress which recognises the needs of everyone		
1. To ensure that everyone has the opportunity to live in a decent, sustainably constructed and affordable home	a. Housing completions compared with regional guidance	To fully meet the housing completion targets in RPG9
	b. Additional provision of affordable housing	To increase the supply of affordable housing both in numbers and as a proportion of total housing stock
	c. Average property price compared against average earnings	
	d. Households on the Housing Register	To reduce the numbers of homeless households in priority need and the number of households in housing need on the Housing Register
	e. Number of unfit homes per 1000 dwellings	To reduce the percentage of unfit/non-decent homes, with a specific target to eliminate them in the public sector by 2010
2. To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment	a. Properties at risk from flooding	To prevent all inappropriate development in the flood plain. By 2010, to increase the numbers of properties protected by 15,000
	b. New development with sustainable drainage installed	All new development applications to show that sustainable drainage has been considered and implemented if appropriate.
3. To improve the health and well-being of the population and reduce inequalities in health	a. Death rates from circulatory disease, cancer, accidents and suicide	Over the long term, to reduce death rates from these diseases appreciably Improve other indicators of health and well-being Substantially diminish inequalities in mortality, health and well-being across the region
	b. Infant mortality rates	
	c. Conceptions among girls under 18	
	d. Life expectancy	
4. To reduce poverty and social exclusion and close the gap between the most deprived areas in the South East and the rest of the region	a. Proportion of children under 16 who live in low-income households	By 2010, to halve the gap between the most disadvantaged communities and the average position of the region
	b. Percentage of population of working age who are claiming key benefits	
	c. Percentage of households in fuel poverty	
	d. Proportion of population who live in areas that rank within the most deprived 20% of areas in the country	
	e. Household income in rural areas	
5. To raise educational achievement levels across the region and develop the opportunities for everyone to acquire the skills needed to find and remain in work	a. Proportion of 19 year olds with Level 2 qualifications (5 GCSEs A*–C or NVQ equivalent)	
	b. Percentage of population of working age qualified to NVQ Level 3 or equivalent	To significantly raise the number of people with Level 3 qualifications in the region
	c. Proportion of adults with poor literacy and numeracy skills	To reduce the proportion of the population with basic skills needs
6. To reduce crime and the fear of crime	a. Level of domestic burglaries, violent offences and vehicle crimes	To reduce crime in the South East in line with national Public Service Agreement (PSA) targets, in particular reduce the gap between the highest crime (Crime and Disorder Reduction Partnership (CDRP)) areas and the best comparable areas To reduce vehicle crime by 30% from 1998/99 to 2004, domestic burglary by 25% from 1998/99 to 2005 and robbery by 14% from 1999/2000 to 2005
	b. Fear of crime	To reduce fear of crime through meeting targets set out in indicator 6a above

(SEERA, 2004).

at or near activity nodes and attractors, where people congregate (Brantingham and Brantingham, 1993; Kinney et al., 2008). These locations include the home, shopping centres, work, school, sports areas, parks and recreation centres and along the routes that connect these nodes and attractors.

Routine activities theory (Cohen and Felson, 1979) (RAT) argues that for a crime to take place there must be an offender, a suitable target and the absence of capable guardians (see also Felson, 1987). Offenders, like most citizens, have routine daily activities (work and school, visiting friends, shopping and entertainment) during which they might discover or search for potential targets (e.g. Maguire, 1982). These routine activities and travel routes form the "awareness space" (Brantingham and Brantingham, 1984) of the offender (see Fig. 2). Indeed, Brantingham and Brantingham (1993, p10) argue "all people, including those who commit crime, develop an awareness space … [from which] crime targets are usually picked".

Insights from environmental criminology and RAT are therefore crucial in understanding the impact on crime of any new development, particularly as potential offenders gradually become aware of new targets. It is important to recognise the characteristics and trends in crime activities, and also in the fear of crime, for the area under investigation. The "fear of crime" is an important consideration;

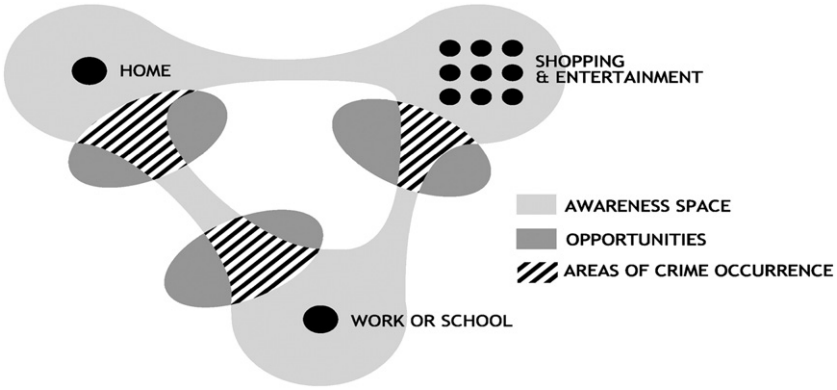

Fig. 2. Awareness spaces–routine activities theory. Source: Adeane (2007) adapted from Brantingham and Brantingham (1981).

perceptions can be major influences on responses to new developments, as noted by the IOCGP (2003):

> "Social constructions are not mere perceptions or emotions, to be distinguished from reality; rather, how we view a social situation determines how we behave. Furthermore, social constructions of reality are characteristic of all social groups, including the agencies that are attempting to implement change as well as the communities that are affected"

Fear of crime is now commonly considered as being a significant issue, which is distinct from crime and worthy of investigation as an area of study. It can result in avoidance behaviour, where sections of the community do not use the built environment due to fear of crime. Furthermore, among others, Brantingham et al. (1977) and Vrij and Winkel (1991) have discussed the idea that fear of crime may exist in locations which, according to official statistics, are low crime areas — and are assumed to be safe. Crime prevention strategies would therefore be unlikely to reach such locations. The use of local fear of crime surveys to measure and map the location of fear of crime is therefore increasingly relevant and necessary. It is also important to identify the nature of the "safety infrastructure", in terms of the organisation and capacity of local policing and the more physical infrastructure, such as CCGT systems.

6.2. Employment of meaningful data

Relevant data should include both crime and fear of crime. For both there may be challenges in terms of access and of utility. Recorded crime represents only a fraction of total crime with the missing data simply referred to as the "dark figure of crime" (Scott, 1990). Notwithstanding this issue, crime data is not always readily available at the scale of analysis required to fully understand crime at the local level. Disaggregated (spatially and temporally), local and up-to-date crime statistics, broken down by crime type are therefore critical in understanding local crime risk.

In the UK it is now possible to gather specific data on levels and trends in crime, disaggregated both by type of criminal activity and also by

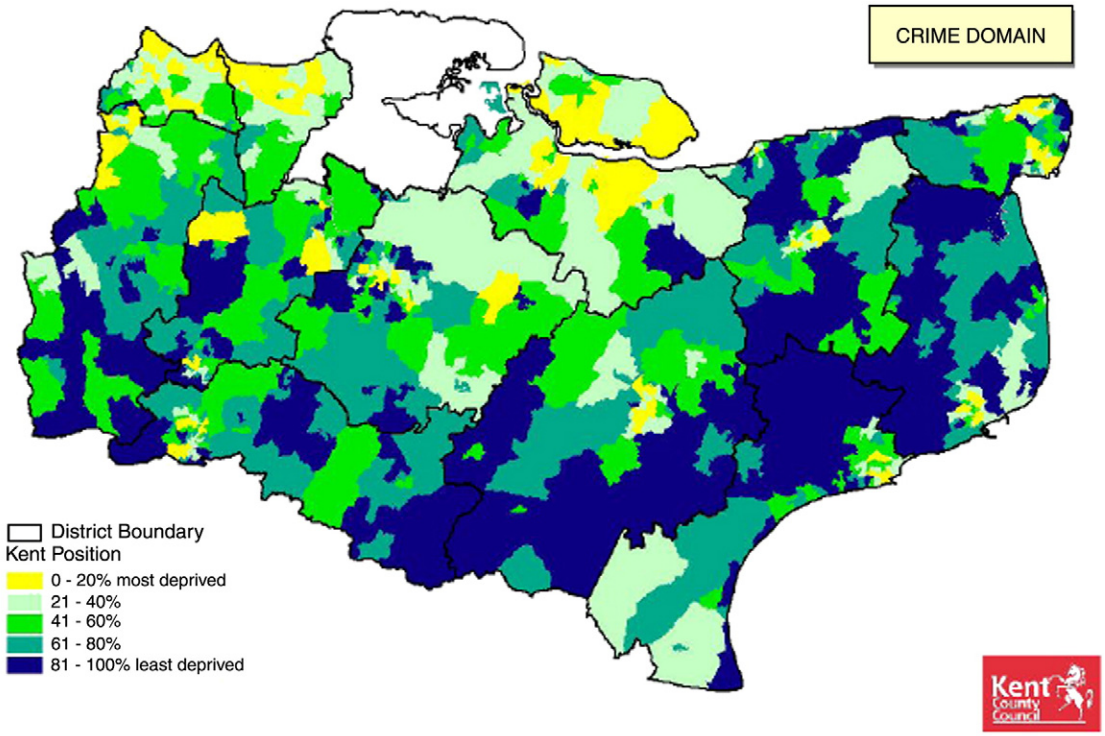

Fig. 3. Kent (excluding Medway) position of LSOAs in Kent—IMD 2007 crime domain. Source: DCLG (2007).

specific location—down to the level of specific wards. Data on "fear of crime" is also increasingly available from local authority Community Strategies, where safety from crime often ranks as one of the highest objectives for the local community. However, as noted in the Sizewell B example, many crimes may not be reported, and not all arrests result in convictions. Indeed, as discussed above recorded crime data has many limitations and the fear of crime is often measured at the community level, rather than in relation to specific local spaces, places or locations. Again, the aggregation of data and a lack of a focus on the spatial dimensions to fear of crime restrict its use at the local level of analysis.

6.3. Development and use of relevant indicators

Although aggregate indicators can sometimes hide more than they reveal, there are some innovative indicator/index approaches, which can be of value to EA practitioners working on crime and safety issues. A good example from England is the Index of Multiple Deprivation (IMD). Average levels of deprivation across the 300 plus English local authorities districts are indicated by rank position relative to all other English local authority districts (where a rank of 1 indicates the most deprived district in England and a rank of 354 indicates the least deprived). The index includes 13 domains, for which disaggregated data is available, updated on an annual basis, and presented in both tabular and diagrammatic formats. The main domains are: income; employment; health, deprivation and disability; education, skills and training; barriers to housing and services; living environment; and *crime*. The Crime Domain covers crime rates for burglary, violence, theft and criminal damage. Fig. 3 provides an illustration of the spatial presentation, by detailed Local Super Output Areas (LSOAs) of the crime domain for sub-areas in Kent. It reveals higher levels of crime in urban areas such as Dover (top NE corner of county) and along the Medway Coast (more urban N of the county). Such information provides valuable detailed local area baseline information on crime and trends over time can also be easily identified.

Fig. 4 provides another way of displaying social baseline information for an area, relative to national standards, including in this case a combined health and safety element. Another recent example of an innovative social index is provided by the "Sociale Index" developed

Description	Range
Very Poor	1-1.25
Poor	1.26-1.75
Barely acceptable	1.76-2.25
Good	2.26-2.75
Very Good	2.76-3

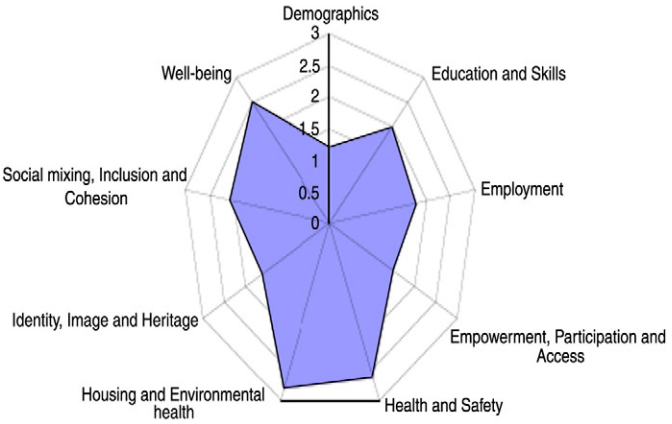

Fig. 4. Another approach to displaying the social baseline of an area.

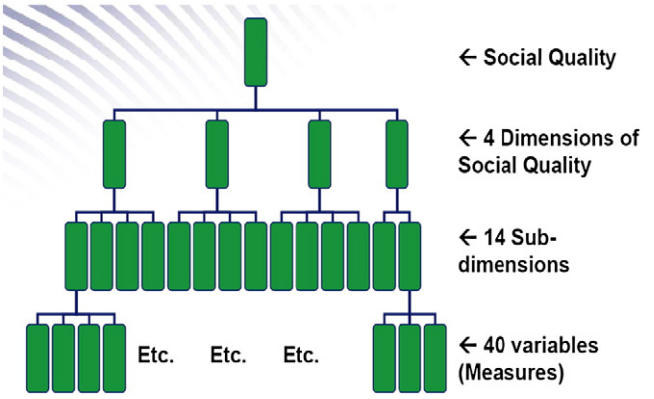

Fig. 5. Rotterdam (NL)—example of the Sociale Index (2008). Source: Koppelaar (2008).

for 64 detailed areas of the city of Rotterdam. Fig. 5 outlines the hierarchical approach to the dimensions involved. The four main dimensions are Personal Abilities (e.g.: health); Participation (e.g.: going to work/school); Bonding (e.g.: mobility); and Living Environment (e.g.: suitable housing, and *safety*). The Rotterdam index can also display trends over time, provides an overview of strong and weak dimensions and sub-dimensions for each of the 64 districts, and provides the ability "to drill" down to underlying variables (Koppelaar, 2008). Key qualitative data, such as on fear of crime is gained from survey, and indicator performance is monitored over time.

7. Mitigation — applying the precautionary principle by anticipating and designing out crime

Crime and fear of crime are not evenly distributed in time and space. The problems in the construction stage of major projects and the concentration of crime in certain locations–often in major urban areas–have already been noted. This allows the targeting of potential "hotspots" to mitigate adverse impacts of new plan and project developments. We have also referred to some mitigation measures used in the construction stage of a major project. There is also a well developed literature and evolving practice on crime prevention through environmental design (CPTED). Following the work of researchers such as Jeffery (1971), Newman (1973), and Brantingham and Brantingham (1998), specific elements of urban design have become widely associated with enhancing or reducing opportunities for crime. Since then, CPTED has evolved since the late 20th century into a robust sub-division within environmental criminology (Cozens, 2008a).

7.1. Environmental criminology

Environmental criminology is "… the study of crime, criminality, and victimisation as they relate *first*, to particular *places*, and *secondly*, to the way that individuals and organisations shape their activities by *place-based* or *spatial factors*" (Bottoms and Wiles, 1997, p305). As briefly discussed earlier, different types of land-uses are associated with crime in different ways and can act as crime attractors, crime generators or crime detractors (Brantingham and Brantingham, 1998; Kinney et al., 2008). Crime attractors are activity nodes, which attract large numbers of people and potentially provide increased opportunities for crime. Crime generators are activity nodes, which provide well-known criminal opportunities to citizens with potentially high motivations to offend. Finally, crime detractors are activity nodes, which lack attractive activities and discourage use by legitimate citizens (Kinney et al., 2008).

7.2. CPTED concepts

CPTED draws on behavioural psychology, and focuses on the relationships between people and the environment (for a review, see

Cozens, 2008b). Environmental cues within the built environment are perceived and decoded and can influence the way people react to an environment. Elements that make legitimate users of a space feel safe (e.g. being visible to others) can discourage illegitimate users from carrying out undesirable acts (such as robbery or theft from motor vehicles). CPTED strives to incorporate natural strategies into human activities and space design. Crime prevention has traditionally relied almost exclusively on labour-intensive procedures (e.g. security guards and police patrols) and mechanical devices (e.g. security cameras, locks and fences) often significantly increasing existing operating costs for personnel, equipment and buildings. CPTED is proactive when implemented at the design stage and it is based on three key strategies; territorial reinforcement, natural surveillance and natural access control.

Territorial reinforcement seeks to promote proprietary concern and a "sense of ownership" in legitimate users of space thereby reducing criminal opportunities by discouraging the presence of illegitimate users. Territoriality is therefore the primary concept from which all the others are derived. It includes symbolic barriers (e.g. signage; subtle changes in road texture) and real barriers (e.g. fences or design that clearly defines and delineates between private, semi-private and public spaces). Access control and surveillance will also promote territoriality by enhancing the levels of informal social control for legitimate users. These strategies act in combination, to use the physical attributes to promote opportunities for surveillance (e.g. placement of windows); to separate public, public–private and private space, to define ownership (e.g. fences, pavement treatments, signs, landscaping and artwork) and define acceptable patterns of usage.

The promotion of *natural surveillance* is a long established crime prevention strategy. Opportunities for residents to observe the street are facilitated by the design of the street, the location of entrances and the placement of windows, for example. This natural surveillance is considered as a form of capable guardianship, which can reduce crime since offenders who perceive that they can be observed (even if they are not), are less likely to offend, in the light of the increased potential for intervention, apprehension and prosecution.

The CPTED concept of using spatial definition to deny access to potential targets is known as *natural access control*, which is focused on reducing opportunities for crime by creating a heightened perception of risk in offenders. There is also formal or organised access control (e.g. security personnel) and mechanical access control (e.g. locks and bolts). The refinement of these ideas has added the strategies of activity support, image/space management and target hardening to the CPTED toolbox.

Activity support uses design and signage to encourage acceptable behaviour in the usage of public space and puts "unsafe" activities (such as those involving money transactions) in "safe" locations (those with high levels of activity and with surveillance opportunities). Image/space management seeks to promote a positive image and routine maintenance of the built environment to ensure the continued effective functioning of the physical environment and this also transmits positive signals to all users. The importance of the physical condition and "image" of the built environment and the potential effect on crime and the fear of crime is supported by an extensive body of research[2]). Poorly maintained urban space can attract crime and deter use by legitimate users. Target hardening, for example by the use of gates and fences, increases the effort and risk of offending and reduces the rewards associated with the commission of a crime. There is, however, much disagreement concerning whether or not target hardening should be considered as a component of CPTED. Crucially, excessive use of target hardening can result in the development of a "fortress mentality" and imagery whereby citizens withdraw behind their own domestic physical barriers. This can damage the self-policing capacity of the built environment and work against CPTED strategies that rely on surveillance, territoriality, image and the legitimate use of space. Gated communities are arguably an example of the "fortressification" of space, a trend which appears to be growing worldwide.

CPTED seeks to optimise opportunities for surveillance, clearly define boundaries (and defining preferred use within such spaces) and create and maintain a positive "image", using the design and management of the built environment in order to reduce opportunities for offending. Within this setting offenders are more visible to legitimate users and offenders may feel more at risk of being challenged, reported or apprehended. Furthermore a well-maintained and appropriately used urban environment can indicate that a sense of "ownership" and social control exists within that community and offenders may feel that the heightened risks associated with offending are simply not worth taking.

An important process within CPTED is the "3 D approach" (Crowe, 2000) which asserts that space needs a designated purpose which is socially, culturally, legally or physically defines acceptable patterns of use which can be supported by design. This approach poses questions such as;

- Does the space clearly belong to someone/some group?
- Is the use of the space clearly defined?
- Does the design match the intended use?
- Does the design facilitate access control and promote surveillance?

As discussed earlier, before applying CPTED, it is important to understand crime patterns and the spatial dimensions to fear of crime as well as local movement patterns as indicated by the evidence from environmental criminology and routine activities theory (Cohen and Felson, 1979) Overall, these ideas argue that planning should be able to positively influence the level of crime and fear of crime. Indeed, Schneider and Kitchen (2001, p233) argue: "If planning is about making places better for people, then it has to address those issues on this list".

8. Some conclusions and recommendations for better impact assessment practice

At both the level of the individual major project (through EIA) and now at the more strategic level of plans and programmes (through the more recent SEA and SA), the field of impact assessment is widening its scope to take on a more holistic approach, including consideration of a widening range of socio-economic impacts. These include, for example, consideration of the "people impacts" of development actions–impacts on day to day quality of life–jobs, health, shelter, education, recreation, community — and also safety. Indeed, from evidence from the UK and Australia, it is clear that safety, and freedom from crime, rank very highly as important issues which make a place a good place to live. This article indicates some examples of the consideration of safety, crime and freedom from crime, in some cases of EIA and SA, but such cases tend to be limited, and they also highlight that there is considerable scope to improve the coverage of these very important elements in everyday life. Issues discussed include: recognition of the significance of the various crime and safety dimensions of both the development and local area baselines; the employment of meaningful crime and fear of crime data; and the development and use of relevant indicators.

The planning profession has a significant role to play in the pursuit of sustainable development and crime and the fear of crime are clearly significant (but at present poorly measured) indicators for sustainability. Crime is a public health issue (Cozens, 2007b) and has been discussed as an externality of development and a form of pollution (Roman and Farrell, 2002). Furthermore, others have highlighted that crime also possesses a carbon footprint, suggesting that crime may also be considered a "green issue" (Cozens, 2002; Clements, 2009). The EIA process may therefore represent a particularly useful

[2] See Lynch, 1960; Newman, 1973; Wilson and Kelling, 1982; Perglut, 1983; Eck, 2002; Kraut, 1999; Ross and Mirowsky, 1999; and Ross and Jang, 2000, for example.

framework for considering the potential impacts of new developments (both in plans and projects) on crime and the fear of crime in the community. In Western Australia, where the police do not routinely assess such crime impacts, this approach could represent a useful way forward. In the UK, where the police are often involved (particularly in the case of the Secured By Design scheme) in the development process, their engagement and the use of more robust indicators for crime and the fear of crime will significantly improve current indicators for crime within sustainability frameworks.

If the precautionary principle is fundamental to sustainability, then crime and the fear of crime require more critical consideration. Such issues must surely have a higher profile in the impact assessment process, at both the project and plan/programme level. This requires an improved analysis and diagnosis of relevant issues, making better use of meaningful data and indicators. For mitigation, lessons can also be gained from CPTED; and all can learn from relevant findings from the field of environmental criminology, which is seen as crucial to understanding crime and its association with land-use.

References

Adeane M. Personal communication via email 17 February. Drawings produced by Design Design, Perth, Western Australia; 2007. Email: Michael@designdesign.com.au.

Armitage R, Gamman L. Sustainability via Security: A New Look. Built Environment 2009;35(3):297–301.

Bottoms AE, Wiles P. Environmental criminology. In: Maguire M, Moran R, Reiner R, editors. The Oxford handbook of criminology. Oxford: Clarendon Press; 1997.

Bramley G, Power S, Dempsey N. What is "Social Sustainability", and how do our existing urban forms perform in nurturing it? UK Planning Research Conference, UCL; 2006. April.

Brand S, Price R. The economic and social costs of crime. Home Office research study number 217. London: Home Office; 2000.

Brantingham P, Brantingham P. Environmental criminology. Beverly Hills: Sage Publications; 1981.

Brantingham P, Brantingham P. Patterns in Crime. New York: Macmillan; 1984.

Brantingham PJ, Brantingham PL. Nodes, paths and edges: considerations on the complexity of crime and the physical environment. J Environ Psychol 1993;13:3-28.

Brantingham P, Brantingham P. Environmental criminology: from theory to urban planning practice. Stud Crime Crime Prev 1998;7(1):31–60.

Brantingham P, Brantingham P, Molumby T. Perceptions of crime in a dreadful enclosure. Ohio J Sci 1977;77(6):256–61.

CAG Consultants. Sustainability in development control: a research report. London: Local Government Association; 1997.

Canter L, Clark R. NEPA effectiveness—a survey of academics. Environ Impact Assess Rev 1997;71:313–28.

Carmona M, Heath T, Oc T, Tiesdell S. Public places urban spaces: the dimensions of urban design. Oxford: Architectural Press; 2003.

CEGB. Social policy statement for Sizewell. London: CEGB; 1987.

Chadwick A. Socio-economic impacts: are they still the poor relations in UK environmental statements? J Environ Plann Manag 2002;45(1):3-24.

Clements J. Revealed: the carbon footprint of a murder. http://blogs.mirror.co.uk/anything-you-say/2009/02/revealed-the-carbon-footprint.html2009 Website visited 2nd October, 2009.

Cohen L, Felson M. Social change and crime rate trends: a routine activity approach. American Sociological Review 1979;44:588–608.

Commission of the European Communities (CEC). On the assessment of the effects of certain public and private projects on the environment. Official J 1985;L175 June 1985.

Commission of the European Communities (CEC). Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment. Brussels: CEC; 2001.

Cozens P. Sustainable urban development and crime prevention through environmental design for the British city; towards an effective urban environmentalism for the 21st century. Cities Int J Urban Policy Plann 2002;19(2):129–37.

Cozens P. Planning, crime and urban sustainability. In: Kungolas A, Brebbia C, Beriatos E, editors. Sustainable development and planning III. WIT transactions on ecology and the environmentSouthampton: WIT Press; 2007a. p. 187–96.

Cozens P. Public health and the potential benefits of crime prevention through environmental design. NSW Publ Health Bull 2007b;18(11–12):232–7 Online: http://www.publish.csiro.au/nid/226/issue/4094.htm.

Cozens P. Crime prevention through environmental design (CPTED) in Western Australia: planning for sustainable urban futures. Int J Sustainable Develop Plann 2008a;3(3):272–92.

Cozens PM. Crime prevention through environmental design (CPTED); origins, concepts, current status and future directions. In: Wortley R, Mazerolle L, Rombouts S, editors. Environmental criminology and crime analysis. Devon, UK: Willan Publishing; 2008b.

Crowe T. Prevention through Environmental Design: Applications of Architectural Design and Space Management Concepts, 2nd edition. Oxford: Butterworth-Heinemann; 2000.

Department of Communities and Local Government (DCLG). Index of multiple deprivation. London: HM Government; 2007.

Department of Environment, Food and Rural Affairs (DEFRA). Securing the future: the UK sustainable development strategy. London: HM Government; 2005.

Department of the Environment, Transport and the Regions (DETR). A better quality of life: a strategy for sustainable development in the UK. London: DETR; 1999.

Department of the Premier and Cabinet (DPC). Hope for the future: the Western Australian state sustainability strategy. Perth: Government of Western Australia; 2003.

DETR. Monitoring progress — indicators for the strategy for sustainable development in the United Kingdom. http://environment.detr.gov.uk/sustainable/quality/monitor/index.htm1999 London.

Dewberry E. Designing out crime: insights from eco-design. Secur J 2003;16:51–62.

DoE (Department of the Environment). Environmental Assessment: a guide to the procedures. London: HMSO; 1989.

DoEN (Department of Energy). Sizewell B Public Inquiry: Report by Sir Frank Layfield. London: HMSO; 1986.

Du Plessis C. The links between crime prevention and sustainable development. Open House Int 1999;24(1):33–40.

Eck J. Preventing crime at places. In: Sherman L, Farrington D, Welsh B, Mackenzie D, editors. Evidence-based crime prevention. London: Routledge, a24194; 2002.

Environmental Protection Authority (EPA). Review of the EIA Process in Western Australia. Perth: EPA; 2009.

European Council. Lisbon European Council 23 and 24 March 2000: Presidency Conclusions. Brussels: Council of the EU; 2000.

Faber N, Jorna R, van Engelen J. A study into the conceptual foundations of the notion of sustainability. J Environ Assess Policy Manag 2005;7(1).

Fattah EA. Understanding criminal victimization: an introduction to theoretical victimology. Scarborough, Ontario: Prentice-Hall; 1991.

Felson M. Routine activities and crime prevention in the developing metropolis. Criminology 1987;25:911–31.

Glasson J. Better monitoring for better impact management: the local socio-economic effects of constructing Sizewell B nuclear power station. Impact Assess Project Appraisal 2005;23(3) pp.

Glasson J. Development of a statewide sustainability checklist for the Western Australian planning system: keeping it simply sustainable. J Built Environ Res 2008;1(1):35-103.

Glasson J. Socio-economic impacts. In: Morris P, Therivel R, editors. Methods in EIA: 3rd Edition. London: Routledge; 2009. Chapter 2.

Glasson J, Chadwick A. The local socio-economic impacts of the Sizewell B PWR power station construction project, 1987–1995: summary report. Impacts assessment unit: Oxford Brookes University; 1995. September.

Glasson J, Heaney D. Socio-economic impacts: the poor relations in British EISs. J Environ Plann Manag 1993;36(3):335–43.

Glasson J, Wood G. Urban regeneration and impact assessment for social sustainability. Impact Assess Project Appraisal 2009;27(4):283–90.

Glasson J, Therivel R, Chadwick A. Introduction to environmental impact assessment:. 3rd Edition. London: Routledge; 2005.

Goodchild B. Housing design, urban form and sustainable development. Town Plann Rev 1994;65(2):143–58.

Herbert D. Crime delinquency and the urban environment. Prog Human Geogr 1977;1:208–39.

IOCGP. Principles and guidelines for social impact assessment in the USA. Impact Assess Project Appraisal 2003;21(3):231–50.

Jeffery C. Crime prevention through environmental design. Beverly Hills: Sage Publications; 1971.

Johnson H. Crime victimisation in Australia: key results of the 2004 international crime victimisation survey, No. 64. Research and Public Policy Series; 2005.

Kinney JB, Brantingham PL, Wuschke K, Kirk MG, Brantingham PJ. Crime attractors, generators and detractors: land use and urban crime opportunities. Built Environ 2008;34(1):62–74.

Knights B, Pascoe T, Henchley A. Sustainability and crime: managing and recognising the drivers of crime and security. Garston, Watford: Building Research Establishment; 2002.

Koppelaar P. The "Sociale Index". Rotterdam Statistics Office (see OISD: EIBURS website, paper presented at Feb 2009 conference); 2008.

Kraut D. Hanging out the no vacancy sign: eliminating the blight of vacant buildings from urban areas. New York University Law Review 1999;74:412–32.

Lynch K. The Image of the City. Cambridge, Mass: MIT Press; 1960.

Maguire M. Burglary in a Dwelling. London: Heinemann; 1982.

Maslow A. Motivation and Personality. New York: Harper; 1943.

Mayhew P. Counting the costs of crime in Australia. Australian Institute of Criminology (AIC). Trends and IssuesCanberra: AIC; 2003.

Newman O. Defensible space people and design in the violent cities. London: Architectural Press; 1973.

Office of the Deputy Prime Minister (ODPM). Sustainability appraisal of regional spatial strategies and local development document. London: ODPM; 2005.

Perlgut D. Vandalism: the environmental crime. Australian Journal of Social Issues 1983;18:20916.

Roman J, Farrell G. Cost–benefit analysis for crime prevention: opportunity costs, routine savings, and crime externalities. In: Tilley N, editor. Evaluation for crime prevention, 14. Crime prevention studies; 2002. p. 53–92.

Ross C, Mirowsky J. Disorder and decay: the concept and measurement of perceived neighbourhood disorder. Urban Affairs Review 1999;34(3):412–32.

Ross C, Jang S. Neighbourhood Disorder, Fear and Mistrust: The Buffering Role of Social Ties with Neighbours. American Journal of Community Psychology 2000;28(4): 401–20.
Schneider R, Kitchen T. Planning for Crime prevention: A Transatlantic Perspective. London and New York: Routledge; 2001.
Scott J. A Matter of record. Polity Press and Basil Blackwell Inc; 1990.
South East England Regional Assembly (SEERA). A better quality of life in the South East —the regional sustainable development framework. Guildford: SEERA; 2001.
South East England Regional Assembly (SEERA). South East England integrated regional framework. Guildford: SEERA; 2004.
UNECE (United Nations Economic Commission for Europe). Policies and systems of environmental impact assessment. Geneva: UNECE; 1991.
Vanclay F. Conceptualising social impacts. Environ Impact Assess Rev 2002;22(3): 183–211.
Vanclay F. The triple bottom line and impact assessment: how do TBL, EIA, SIA, SEA and EMS relate to each other? J Environ Assess Policy Manag 2004;6(3): 265–88.
Vrij A, Winkel W. Characteristics of the built environment and fear of crime: a research note on interventions in unsafe locations. Deviant Behav 1991;12:203–15.
Wilson J, Kelling G. The Police and Neighbourhood Safety. Broken Windows. The Atlantic Monthly 1982;3:29–38.
Wood C. Environmental impact assessment: a comparative review—2nd edition. Harlow: Prentice-Hall; 2003.

John Glasson is Professor Emeritus in Environmental Planning, and Founding Director of the Oxford Institute for Sustainable Development (OISD), at Oxford Brookes University, Oxford (UK). He is also a Visiting Professor at Curtin University in Perth, Western Australia. His research interests include impact assessment, regional planning and sustainable development.

Paul Cozens is a Curtin Research Fellow in the Department of Urban and Regional Planning at Curtin University of Technology in Perth, Western Australia. He is a co-director of the Design Out Crime Research Centre and an expert in the field of crime prevention through environmental design (CPTED). His research focuses on the design, use and management of the built environment to reduce opportunities for crime.